

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
RESEARCH AND TECHNOLOGY RESUME

TITLES

Ground-based Spectropolarimetric Studies of the Outer Planets and Titan (NSG-7334)
High Resolution Spectral Imagery for Periodic and New Comets (NAGW-883)

PERFORMING ORGANIZATION

Washington University

INVESTIGATOR'S NAME

Wm. Hayden Smith

DESCRIPTION (a. Brief statement on strategy of investigation; b. Progress and accomplishments of prior year; c. What will be accomplished this year, as well as how and why; and d. Summary bibliography)

a). Using novel spectropolarimetric imaging techniques, we have studied the outer planets, Titan, and various comets. b.) In the previous year, we submitted and have now in press or published fourteen papers on studies of comets and planets, as well as instrumentation developments to enhance our observational studies. c). no further work is planned this year as we were not funded for further research. d). see attached pages of papers; published, in press, or submitted.

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OF POOR QUALITY

103. Spectral Differential Imaging Detection of Planets about Nearby Stars, P.A.S.P., 99, 1344 (1987).
104. Spectral Imagery with an Acousto-Optic Tunable Filter, (with Schempp, W.V., Conner, C., and Katzka, P.), P.A.S.P., 99, 1335, (1987)

Papers in press:

105. Spatial and Temporal Variations of the NH_3 Abundance and Cloud Structure in the Jovian Troposphere Derived from CCD/Coude Observations (with K.Baines and C.Alexander), Paper.CJ.9, "Time Variable Phenomena in the Jovian System", Flagstaff, 1988, in press, NASA SP____.
106. A Holographic Fourier Transform Spectrometer for Astronomical Applications, (with W.Schempp), Applied Optics, accepted, 1988.
107. The D/H Ratio for Jupiter (with K.Baines, and W.V.Schempp), Ap.J., ^{Dec. 1 issue} ~~accepted~~, 1988.
108. D/H for Uranus and Neptune, (with K.Baines, W.Schempp, and J.Simon), Ap.J., ^{Dec 1 issue} ~~accepted~~, 1988.
109. Diurnal Observations of H_2 Quadrupole Features in Neptune, (with W.Schempp and K.Baines), Ap.J., accepted, 1988.
110. Measurements of the H_2 4-0 S(0,1, and 2) Features in Jupiter, (with Simon, J., Schempp, W.V., and Conner, C.), Icarus, accepted, 1988.
111. The 5577 Å and 6300 Å [O I] Features in Comet Halley, (with W.V.Schempp), Icarus, accepted, 1988.
112. Search for K I in the Coma of Comet Giacobini-Zinner during an Apulse, (with W.Schempp, B.Lutz, and D.Lien), P.A.S.P., accepted, 1988.
113. Study of Diffuse Interstellar Bands in Comet Halley, (with W.V. Schempp), Ap.J., accepted, 1988.
114. Spectral Difference Imaging of Substellar Objects, Workshop on the Origin and Evolution of Planetary Systems, STSCI, Baltimore, May 9-11, 1988.

Submitted papers:

114. Search for Fluorescence of H_2 in Comet Halley, (with R. Wolstencroft and B.Lutz), P.A.S.P., submitted, 1988.
115. Observations of the H_2 $\text{S}_3(1)$ and $\text{S}_4(1)$ Transitions in the Atmosphere of Neptune and Uranus, (with K.Baines and W.Schempp), Ap.J., submitted, 1988.